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to give us knowledge of physical fact; experience shows a world cold to inner needs, and no intuition can enable us to reconstruct a picture from a shred of the canvas. A *"meditatio generationis futuris,"* however, can only be fruitful close to the range of scientific prediction, minute as compared with cosmic processes, but sufficient to establish a healthy, active morality, though lacking that sanction of an admiring cosmos so ardently sought in morbid or self-doubting civilizations.

It may be replied, however, as philosophers have often claimed, that the scientific world is not the real world, but to examine this assertion requires a study of the concrete significance of scientific concepts. That study is too difficult to be undertaken in this paper, but will soon follow.

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PERCEPTION AND THINKING

DESCARTES, in the early and somewhat neglected treatise, "Rules for the Direction of the Mind" formulates the problem of knowledge in the following manner. "Now no more useful inquiry can be proposed than that which seeks to determine the nature and the scope of human knowledge . . . , we first of all divide the whole problem relative to it into two parts; for it ought either to relate to us who are capable of knowledge, or to the things themselves which can be known; and these two factors we discuss separately."[1] Again, "In the matter of cognition of facts two things alone have to be considered, ourselves who know and the objects themselves which are to be known."[2] In these two passages we observe the formulation of the most significant contrast in the domain of modern philosophical analysis. It is a contrast, expressible in many ways, between the knower and the known, between consciousness and its object, between the subjective and the objective, between mind and matter, between man and nature. In our traditional language we say that Descartes is a dualist. This dualism, stated here as a distinction between the knower and the known, and elsewhere emphasized as a dualism of mind and matter, is ultimately reduced by Descartes to a dualism of mechanism and teleology. An empirical observation reveals two entirely different kinds of activity, mechanical and purposeful.[3] Thus, in distinguishing human beings from automata, Descartes says: "And the second difference is, that although machines can perform certain things as well as or perhaps better than any of us can do, they infallibly fall short in others, by the which means we may discover that they did not act from knowledge, but only from the disposition of their organs. For while reason is a universal instrument which can serve for all contingencies, these organs have need of some special adaptation for every particular action. From this it follows that it is morally impossible that there should be sufficient diversity in any machine to allow it to act in all the events of life in the same way as our reason causes us to act."[4] Descartes segregates the mechanical and calls it matter and the teleological and terms it mind. The enlightening thing, however, is not the contrast between two realms of existence, but the distinction between two kinds of activity. But subsequent analysis emphasized the existence contrast, the subject-object, the mind-matter relation. Teleology could not long maintain itself in the face of Newtonian physics.

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[1] "The Philosophical Writings of Descartes," Eng. tr., Haldane and Ross, Vol. I., pages 26–27.

[2] *Ibid.*, page 35.

If we turn from Descartes to Plato we observe a very different contrast. Consciousness as something outside of nature and in contrast to it is a conception totally foreign to the Greek mind. The distinction between the subjective and the objective was unknown among the Greeks. For Plato the contrast is between two methods of having experience, perception and thinking. On the side of perception we have the particular, the changing, the imperfect, opinion, becoming. On the side of thinking we have the universal, the unchanging, the perfect, knowledge, being. Plato is essentially a moral philosopher, and under the constraint of ethical, mystical, and esthetic interests goes on to correlate perception with appearance and thinking with reality.

In both Plato and Descartes there is a dualism, a dualism which, in response to widely different interests, is subjected to different metaphysical interpretations. But at bottom it seems to me that the empirical distinction of each is an impressive way of describing the same fundamental fact, the fact that perception and thinking, mechanism and teleology, mark a significant, perhaps the most significant of all, metaphysical distinction. It is my purpose in this paper to describe perception and thinking, emphasizing the contrast between them, and to note certain philosophical bearings of the distinction.

By perception I mean what Plato means by it, namely, sense experience. And for Plato perception is non-cognitive. There is a significant passage in the seventh book of the "Republic" which is worth noting. *"I mean to say that objects of sense are of two kinds: some of them do not excite thought because the sense is an adequate judge of them; while in the case of other objects there is a mistrust of the senses which only stimulates inquiry."*[5] As an illustration he takes the case of the three fingers—a little finger, a second finger, and a middle finger. *"Each of them appears a finger, whether seen in the middle or at the extremity, whether white or black, or thick or thin—that makes no difference; a finger is a finger all the same. And in these cases the question, what is a finger? is not presented to the ordinary mind; for the sight never intimates to the soul that a finger is other than a finger."* But as soon as some problem is suggested as, for example, the greatness or smallness of the finger, then *" in these perplexities the soul naturally summons to her aid calculation and intelligence. . . . " "For if absolute unity be perceived by the sight or any other sense, then, as we were saying in the case of the fingers, there will be nothing to attract toward being; but when there is some contradiction always present, and one is the reverse of one and involves the conception of plurality, then thought begins to be aroused within, and the soul perplexed, and wanting to arrive at a decision asks, 'What is absolute unity?' "* Such is Plato's contrast between perception and thinking. It is interesting to read the entire passage with Professor Dewey's analysis of reflective thinking in mind. Sense experience is, for Plato, non-cognitive. Knowledge involves a situation of conflict and the conception of plurality.

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[3] For this interpretation of Descartes I am indebted to Professor Woodbridge, though I have, by a careful reading of Descartes, satisfied myself of its truth.

[4] Ross and Haldane translation, Vol. I., page 116.

Modern philosophy has given a very different view of perception. Owing to the consciousness-object relation, a contrast in terms of which the problem of knowledge is set, perception is viewed as a cognitive act. The mind, according to Descartes, is essentially a thinking thing. Consequently, perception as well as every other act of interaction with an object, must contain an element of consciousness. Perception *must* be cognitive because the mind is so defined that it could not be anything else. But with Plato there is no initial and overawing definition of mind with which an account of sense experience must conform; there are no alliances with a mind-object hypothesis. The approach is more direct, empirical, and natural. May we not return to the simpler standpoint of Plato and describe perception apart from modern epistemological entanglements?

Sense experience is limited, confined, bound down to the given, the present, the immediate. I can have no sense experience of the absent, the distant, the transcendent. To say that perception is concerned with the immediate is to say that it does not admit of distinctions. The content perceived is a unit, an undivided whole. To introduce distinctions is to depart from the given. We may express the same thing by saying that perception operates with particulars. Reality in the form of particulars means a world of pure immediacy. In such a world there may be movement, passage from part to part; there may be activity of the impulsive and instinctive kind; there may be feeling, emotion, living; there may be efficiency and alertness; but thinking, intelligence, reflection, consciousness, there is not. Perception, furthermore, is mechanical in its operation. There is adjustment of part to part, spatial and temporal continuity, invariable and uniform activity. There are no inductive "leaps," no "final" causes, no bridging of gaps, no far-glancing sweeps. Perception is activity tied to a particular, or what is the same thing, activity concerned with the immediate.

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[5] I quote from Jowett's translation.

Thinking is entirely different from perception, as much so as, in the dualism of Descartes, mind is from matter. The central factor in all thinking is suggestion, implication.[6] Every thought, every idea, every act of consciousness, is an inference. Inference is derived from the Latin, *ferre,* to carry; induction from *ducere,* to lead. This element of movement, implied in each word, is present in every inference. Spatially it is a transportation from here to there, temporally it is a transition from now to them. An inference is a sweep, a span, a leap; it involves movement and multiplicity. To think means to analyze, to discriminate, to set one thing over against another, to introduce distinctions. That is to say you can not think about *one* thing, you can not be conscious of unity. Concentration is not thought reduced to unity, but thought maintained by novelty, variety, change, movement.

As perception is concerned with the immediate, so thinking involves transcendence. Implication means detachment from particulars, a freedom to roam beyond the immediate, a peering over the edge of the given, a break in physical continuity. Examine the words which contain the faintest cognitive connotation, as, for example, "vague impression," "hint," "guess," "conjecture," and you will note that they operate in a situation involving detachment from immediacy. And so for the more highly cognitive terms as, "supposition," "assumption," "hypothesis," "theory"; they have meaning only as tentative explanations of situations where the explanation is not present in the same sense in which the situation is present. If the answer were present in the same way in which the question were present there would be no question. Neither would there be thinking, there would be only perception. Transcendence means the given radiating significant leadings, the present tingling with a sense of futurity. Over the given rises a mist of meaning, enveloping spheres of influence surround it.

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[6] I do not pretend to say anything here which Mr. Dewey has not said or implied in "How We Think."

This is more than mechanism. In a mechanical world nothing novel can occur. Contingency and risk are out of the question. Tied to a particular, one is safe; no "accident" can happen. But mechanism is monotonous. Teleology enters to make room for sport. One part of experience plays into the hands of another part, it suggests, it implies, it tells. The crux of teleology is transcendent implication, activity in the light of ends, the operation of "final" causes. For mechanism contingency is eliminated, causality is the ruling category. For teleology, chance and not necessity is supreme. Reality as contingent implies the objective existence and reality of time. Aristotle was right in pointing out that if time were not real there would be no such thing as potentiality, there would be only actuality. It is the objective reality of time which makes teleology possible.

Now the specific differentia of every act of thought is a time quality. We do not mean this in the sense that an act of thought occupies time, but in the sense that an act of thought involves time transcendence. Reflection means acting in the light of consequences. The absent and future are operative *as if* they were present. Time is just as much an objective quality of an object as its color or taste. When I react to its color or taste I perceive it, when I react to its time aspect I think it. And this is what we mean when we say that thinking is teleological and contrast it with perception which we say is mechanical.

If all thinking involves transcendence, a working loose from particulars, how is such activity to be conceived? What gives one the right to go beyond the immediate? what supports me when I make the leap? In short, what is the basis of induction?

In the "Phaedo" Plato makes the doctrine of "recollection" the basis of induction. I see Cebes, and he reminds me of, suggests, implies Simmias. It is because they both "participate" in a "form" that I can get over from the one to the other. "Forms" for Plato are objective and real, and serve as a metaphysical basis for logical theory.

In modern philosophy the problem is solved quite differently. Hume, for example, believing all reality to be in the form of particulars, rightly on this assumption reduces all induction to enumeration. Kant, on the other hand, like Plato has recourse to "forms," but they are subjective, they are mental concepts, categories. The mind is endowed with a conceptual apparatus which enables it to perform inductive leaps of thought. The mind by definition is just the kind of thing which can turn the trick. But such a procedure, a sort of "vicious" *animism,* is, I think, a consequence of the mind-object relation. Induction must go beyond enumeration, that is, it must transcend particulars. But the object side of the relation is in the form of particulars. Descartes had riveted that conception on philosophy by saying that matter was mechanical. On this assumption the basis of induction can not be objective, at least not an induction which claims to be more than enumeration. Hume had shown that. Kant, therefore, turns to the mind side of the relation and makes the basis of induction subjective. Plato's doctrine of "recollection" may be a figure of speech, but I think it is less metaphorical than Kant's epistemological machinery designed and diagramed after the pattern of Newtonian physics. It is still mechanism in disguise.

The fact of intelligence demonstrates the existence, in some sense, of universals. In a world of particulars neither induction nor thinking, neither consciousness nor reflection could ever arise. No wonder Gorgias ended in nihilism! If perception were the only means of experience, I could not *know* anything, and even if I did know it, I could never *communicate* it. Intelligibility and communication imply more than perception, particulars, and mechanism. Reflection means the operation of more influences than are discoverable as present elements in any given situation. The moment one portion of experience attains a "value," it acquires a superiority in virtue of which it becomes regulating and controlling. Particulars become weighted; they have a representative value; they become signs. They are no longer points, they are spheres of influence. To apply a general concept to a particular situation is to import into that situation a borrowed efficiency.

The fact of intelligence demonstrates the existence in some sense of universals. It implies, too, the fact of teleology and the objective existence of time. May we not say that time is a universal? The cardinal metaphysical problem of the relation of the universal to the particular would then become the problem of the relation of teleology to mechanism, of time as one aspect of reality to its other aspects. Many of the logical difficulties which have arisen in connection with the treatment of time have, I dare say, resulted from the attempt to represent time as a particular. Predicates have been applied to it which are applicable to particulars, but which become meaningless when applied to universals. So, then, to say that thinking involves transcendence, or that it operates with universals, or that it is teleological, or that it is a reaction to the time quality of reality, is to say one and the same thing.

Briefly to summarize, we have on the one side perception, the particular, unity, mechanism, action. On the other we have thinking, the universal, multiplicity, teleology, consciousness. This dualism, as I maintain, is absolute. Two crucial cases present themselves for discussion. First, all thinking involves multiplicity; second, all perception is non-cognitive.

To say that all thinking involves multiplicity and movement is to say that *there is no such thing as static awareness.* By *static awareness* I mean "mere presentation," "simple apprehension," "intuition." The view that there exist such simple acts of cognition where the object is unity and the act void of movement goes back doubtless to Descartes. In the "Rules" he enumerates intuition and deduction as the two cognitive operations and distinguishes them on the basis of rest and movement, or what amounts to the same thing, simplicity and complexity. "Hence we distinguish this mental intuition from deduction by the fact that into the conception of the latter there enters a certain movement or succession, into that of the former there does not."[7] Intuition is just static staring. This view was inevitable for Descartes. Having made the whole nature of mind to consist in thinking, then consciousness must be present in every act and form of experience, the simplest as well as the most complex. Now I maintain that what Descartes terms "intuition" simply does not exist. All thinking is what he describes as "deduction."

In support of this contention I point to the fact that, as we are frequently told, a logical "term" is an abstraction, that the simplest act of thought is an inference, a judgment. By saying that unity can not be an object of thought, I do not mean that one can not think about unity. I mean to say that attention, concentrated on one-ness in a single static act of awareness, with no going beyond, with no distinctions nor comparisons, is impossible. So long as I am concerned with just a term, I am tied to a particular, I am engulfed in immediacy, I am just perceiving. There is no awareness there. Wherever there is consciousness, there is movement, vibration, some tremor, however faint. Experience reduced to unity becomes absorption; I am one with the object as the wheels are one with the machine. In the appreciation of music, music does not move me, but as expressed by Santayana, I move with the music. It may be said that I do not draw the distinction between consciousness and self-consciousness. In reply I can only say that such a distinction seems to me to be meaningless. It is as if I were to say that there is a conscious consciousness and an unconscious consciousness.

I point also to the fact that, in the absolutistic analysis, consciousness is denied to the Absolute. No movement from the given to the not-given is possible because, as we are told, the Absolute is the All-Given. It is an eye which can *see* all things at once; that is, it can

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[7] Ross and Haldane translation, page 8.

perceive, but it can not be conscious. Distinctions are obliterated, and distinctions are the marks of reflection. Static such an experience is to be sure, but not conscious. The Absolute is in the highest sense an "Individual," it is a unit. The Whole can not go beyond itself, because there is no beyond to go to. So far as consciousness and unity or consciousness and multiplicity are concerned, the logic of the case seems to me to be the same whether it is applied to the Absolute or to human experience. It is not here a question of *what* consciousness is, but *where* it is. It is not to be found where there are no temporal distinctions, where there is no movement. It is not to be found where experience is concerned with unity. Reality in the form of particulars would be a world where consciousness could never appear.

We maintain that all thinking is conversant with multiplicity and movement, and that is to say that there is no such thing as static awareness. Our second crucial point is that perception is non-cognitive, that it has no affiliations with a theory of knowledge. Perception occurs at a level below cognition. In Descartes's language, it is the interaction of matter with matter. The baby in seeing is all eyes. In listening to music, so far as the experience is purely emotional, I am all ears. I do not distinguish myself from the music; I do not *know* that "I" am hearing music. I and the music are one. The immediate does not admit of distinctions, not even the subject-object contrast in its simplest form of the self and the not-self.

Modern psychology teaches that a "pure" sensation is an abstraction. Is not this, it may be asked, sufficient evidence against my view that perception is non-cognitive? In reply I should admit that a pure sensation is an abstraction *for knowledge* or *for consciousness.* And this, I may urge, is only another way of saying that the immediate is never an object of thought, that wherever there is consciousness there is a going beyond the given sense experience. We agree that pure sensations are abstractions for thought; our entire foregoing analysis has been intended to show just that. The recovery of the immediate is impossible for thought, for when the immediate is regained, thought is no longer there; or, if thought is there, it is no longer the immediate, for the entry of thought means the transcendence of the immediate. But from this to conclude that pure sensations do not exist is an unwarranted conclusion. To draw such an inference is the outcome, I think, of the assumption that all experience is in the interest of knowledge, an assumption going back perhaps to the knower-known contrast of Descartes. Since the knower is essentially a thinking being, some element of consciousness is present in every interaction between the knower and the known. Idealism makes consciousness an integral, and not to be disassociated, part of perception. Consciousness and perception are inseparably united because the mind-object relation makes any other view impossible. What I do not understand is how idealism can maintain its thesis and admit the existence of instinctive and impulsive activity. Of course panpsychism is one way out, but that again is to introduce the conception of an unconscious consciousness, a conception which is to me unintelligible. For idealism, in virtue of its initial assumption, consciousness and perception are so closely united that it would require a miracle to separate them. In the light of my contention the two are so different that it would require a miracle to unite them. Sensations may and most frequently do, in adult life perhaps always do, occur along with consciousness, *but the consciousness is no part of the sensation.* "Beauty is its own excuse for being," consciousness does not make it. On the level of sense experience I may perceive beauty; and then too I may be conscious of it, but when I am conscious of it I have departed from the immediately given sense experience: interpretation, the introduction of distinctions, transcendence, have then entered. Perception, we conclude, operates in the interest of action and adjustment and has no affiliations with a theory of knowledge. Its mode of procedure is mechanical, its sphere of operation is the immediate, and neither mechanism nor immediacy admit of interpretation. In a world of pure immediacy, living, but not a life, being, but not thinking, acting, but not personality, are possible.

In the foregoing analysis we have proceeded, not from the standpoint of types of existence, but from the standpoint of kinds of activity. And activity, as we have noted, is of two sorts, mechanical and teleological. In Supplement XXII. of the "Critique of Pure Reason" Kant says: "It is something very remarkable that we can not understand the possibility of anything from the category alone, but must always have an intuition in order to exhibit by it the objective reality of the pure concept of the understanding." As I read the Supplement it seems to imply the recognition on the part of Kant that, although the mind be endowed with its cognitive forms, reality must still be the kind of a thing which fits the forms. It is equivalent to saying that, after all, the forms are objectively real. This would mean, in terms of our own analysis, that intelligence could never arise in a world which was not intelligible. That is to say, mechanism and teleology are not just forms of human experience, they are predicates of reality. Reality is itself *both* mechanical *and* teleological.

Perception and thinking are also types of activity. What is needed is a differentia whereby we may distinguish them. I think we discover this differentia in the presence of a time element in some and not in other reactions. Reactions to the immediate we call perception, reactions to the time quality of reality we call thinking. Or what is the same thing, when I react to the mechanical aspect of existence I am perceiving, when I react to its teleological aspect I am thinking. And thus we come to contrast perception with thinking, the particular with the universal, the given with the implied, unity with multiplicity, immediacy with transcendence, mechanism with teleology.

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VON BECHTEREW[1] AND UEBERTRAGUNG

THE conventional child having been burnt by the candle flame does not again grasp it, but draws his hand away therefrom. He reacts not to the immediate stimulus, but to an experience which is in him associated with that stimulus. If one's finger has been withdrawn on the prick of a needle, the touch of a blunt object may produce withdrawal. A response primarily elicited by one class of objects becomes elicited by another class of objects associated with the first. In the Russian laboratories, this process has been studied in other varieties of response. The first variety concerns reactions that are not under voluntary control, like the salivary reflex. This is elicited by sour stimuli. If now one combines a certain (secondary) external stimulus often enough with the sour one, after a time the secondary stimulus alone will elicit the salivary reaction. The next variety concerns reflex responses of muscles which are also under voluntary control. Thus if one combines electric stimulation of the sole of the foot with a color stimulus, after a time the color stimulus alone elicits the reaction in the foot primarily associated with the electrical stimulus. The third variety concerns reactions which are not reflex movements, but are conventionalized responses to the primary stimulus. For example, a finger movement is employed as the response to a given light stimulus. If a sound stimulus is combined with the light, the subject will after a time react to the sound alone, "and be sure that the light was seen." If the subject responds to a given sound with finger flexion, and this stimulus is then combined with a light stimulus, the light stimuli will elicit the finger movement after the sound stimuli are stopped. Indeed, it is reported that the light stimuli need not have been given simultaneously with the sound stimuli at all, if only the lights follow the rhythm of the sound stimuli. As von Bechterew generalizes the principle,

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[1] Based on the data in the "Objektive Psychologie." Cf. also Watson, "The Place of the Conditioned Reflex in Psychology," *Psych. Rev.*, 23, 1911, pages 89–116.